**NEVADA DIVISION OF ENVIRONMENTAL PROTECTION**
**F A C T  S H E E T**
(pursuant to NAC 445A.236)

**Permittee Name**: Empire Ranch Golf Course
1875 Fair Way
Carson City, Nevada 89701

**Permit Number**: NEV92015

**Description of Discharge**: Treated Effluent Reuse for Irrigation

**Location**: Empire Ranch Golf Course
1875 Fair Way
Carson City, Nevada 89701

| | | | |
|---|---|---|---|
| Part E2 Sec 10 & W2 Sec 11 | Township 15 North | Range 20 East | Mt Diablo Base & Meridian |

| FEATURE | LAT (d m s) | LON (d m s) | LAT (decimal °) | LON (decimal °) |
|---|---|---|---|---|
| Point of Diversion (Brunswick Transmission Pipeline) | 39° 10' 19.0" N | 119° 43' 02.0" W | 39.1719444° | -119.7172222° |

**General**: Carson City Wastewater Reclamation Plant (CCWRP) wastewater is treated to secondary standards and effluent is delivered to the Empire Ranch Golf Course for use on 180 acres of turf and 30 acres of other water features (ponds and wetlands) within the management control of the permittee. Application will be by drip and spray irrigation to turf and other landscape features. Runoff from the reuse sites is prohibited. The permit (NEV92015) is held by Empire Ranch Golf Course, as the Permittee, and is the responsible party for the onsite reuse of treated effluent.

The first permit authorizing the use of reclaimed wastewater for irrigation of this site was issued to Darling Ranch in 1993. Irrigation using treated effluent is conducted in accordance with an Effluent Management Plan (EMP) submitted to, and approved by, the Nevada Division of Environmental Protection Bureau of Water Pollution Control (BWPC). An approved EMP is on file at the BWPC.

**Flow**: 2.13 MGD Daily Maximum and 30-day average. Annual application volume authorized by supplier is 1,385 acre feet per year (AF/YR) on approximately 210 acres of turf and other landscape and water features.

**Characteristics**: The permit is for the discharge of tertiary treated, partially denitrified, filtered, and disinfected effluent for use in the irrigation of turf and other landscape via drip and spray irrigation at the Empire Ranch Golf Course in Carson City, Nevada. The golf course is located on the east side of Carson City, south of U.S. Highway 50, and is bounded on the east by the Carson River. Operating procedures specified in the proposed permit and the EMP are required to prevent discharge to the river under normal conditions. Storage ponds or water features on site containing treated wastewater are required to be managed and operated in accordance with conditions included in the approved EMP to minimize the potential for discharge to the Carson River during storm events. Ponds and water features are required by permit condition to contain, with no discharge, the once-in-one-hundred year, 24-hour storm.

The annual hydraulic loading limit was not exceeded in the last permit period, 2005 to 2010. The maximum daily flow did not exceed the daily maximum flow of 2.13 MGD allowed in the approved 2005 EMP. The proposed Daily Maximum flow rate for this permit cycle will be set at the approved EMP rate of 2.13 MGD with the allowed annual application volume set at 1,385 acre feet per year.

**Reuse Water Quality supplied by the Carson City Wastewater Reclamation Plant [NEV90008]**:

| | |
|---|---|
| $BOD_5$: | 30 mg/l 30-Day average; 45 mg/l Daily Maximum |
| TSS: | 30 mg/l 30-day average; 45 mg/l Daily Maximum |
| Fecal Coliform (cfu, mpn[1]) | 2.2/100 ml 30 day average; 23/100 ml daily max. |
| Total Nitrogen - N: | 20 to 40 mg/L (average 28 mg/L) |
| pH | Between 6.0 and 9.0 SU |

[1] cfu = colony forming unit  mpn = most probable number

**Receiving Water Characteristics**: Treated effluent used for irrigation has the potential to discharge to groundwater, which is encountered at depths ranging from approximately 7 to 23 feet below grade surface. Effluent limitations are based, in part, on primary drinking water standards to protect the potential beneficial use of groundwater resources.

Groundwater flow direction is reported to be in an easterly direction toward the Carson River. Groundwater monitoring wells MW-1, 2, and 3 are used to characterize groundwater conditions of the course. MW-3 is located at the west side of the course (upgradient) and MW-1 and MW-2 are located on or near the east property boundary (downgradient), between the course and the Carson River. The proximity of MW-1 and MW-2 to the Carson River suggests that groundwater elevation and quality at these locations may be influenced by river water.

The profile of groundwater at each monitoring location is as follows (4th Quarter 2004to 4th Quarter 2010):

| Well Location | Range of Depth to Water (feet below top of casing) | Total Nitrogen as N Concentration (mg/L, 2005 through 2010) |
|---|---|---|
| MW-1 | 7-12 | 0-0.3 |
| MW-2 | 7-13 | 0-1.2 |
| MW-3 | Dry-23 | 0.5-12.3 |

Monitoring well 3 encountered fluctuating total nitrogen concentrations during the 2005-2010 permit cycle. From early 2004 to the end of 2006, the total nitrogen concentration was consistently below 4 mg/l. For approximately a year period several concentration levels reported for MW-3 required the permittee to take action to reduce the total nitrogen concentration monitored at the site to meet required threshold response requirements. [Report date and concentration levels for this period were: 12/06: 8.9 mg/l; 3/07: 10.4 mg/l; 5/07: 10.4 mg/l; 8/07: 7.6 mg/l; 12/07: 3 mg/l; 2/08: 12.3 mg/l] Beginning June 2008 (4.9 mg/l), reported concentration levels for total nitrogen at MW-3 have remained under 5 mg/l, except for May 2010, the reported level was 6.4 mg/l, which is under a response action threshold of 7 mg/l. The concentration level for total nitrogen at MW-3 appears to be stabilizing below 5 mg/l.

The current permit contains threshold provisions requiring response actions if total nitrogen as nitrogen concentrations increase to 7, 9, or 10 milligrams per liter (mg/L) at any of the monitoring well locations. This provision is retained in the proposed permit to provide groundwater protection.

**Drinking Water Protection:** This Bureau of Water Pollution Control (BWPC) permit facility lies within a 5-year, a 10-year and 25-year Wellhead Protection Area (WHPA) established for this vicinity. The permitted facility property lies within the 3,000 foot radius Drinking Water Protection Area (DWPA) of two Public Water System (PWS) wells, and the 6,000 foot radius of two additional PWS wells. Reuse water used by the facility in accordance with permit limitations is not expected to adversely impact PWS wells in the area.

The golf course is immediately east (downgradient) of Carson City Water Department municipal pumping well #40. Records on file indicate that that well #40 is advanced to a total depth of 1260 feet below ground surface (bgs) with mill-slotted casing extending between 473 to 1260 feet bgs. The top 50-feet of the well is completed with a sanitary seal, below which the annular space is filled with gravel pack to depth. The Carson City Water Department will be provided notice of this proposed permit renewal.

**Corrective Action Sites:** This BWPC permit facility is not within a one mile radius of any active Bureau of Corrective Actions (BCA) facility site.

**Proposed Effluent Limitations:** During the period beginning on the effective date of this permit, and lasting until the permit expires, the Permittee is authorized to manage and discharge reuse water supplied by the Carson City Wastewater Reclamation Plant (CCWRP) on the Empire Ranch Golf Course (ERGC). The ERGC is authorized to irrigate turf and other landscape features with effluent treated in accordance with permit NEV90008 issued to CCWRP. The permittee is authorized consumptive use of treated effluent water for spray and drip irrigation and soil conditioning at the site.

- The permittee shall monitor the flow (Outfall 001) of treated effluent delivered to the Empire Ranch Golf Course for use authorized by this permit [NEV92015] at a flow meter accessible at the facility and

available for discharge measurement.

- Analytical results taken for compliance with the monitoring requirements specified below shall be obtained from CCWRP [NEV90008] and reported by the Permittee for permit compliance before blending with any water supplied by any other source. The quality of the irrigation water used by the Permittee may be reported as calculated values when the treated effluent is blended with another water supply.

Discharge shall be monitored and reported by Permittee in accordance with limitations specified in Table I.1.

**TABLE I.1**

| PARAMETER | LIMITATIONS | | MONITORING REQUIREMENTS [1] | |
|---|---|---|---|---|
| | 30-Day Average | Daily Maximum | Measurement Frequency | Sample Type |
| Flow (Outfall 001) MGD | 2.13 | 2.13 | Daily | Flow meter |
| Total Nitrogen[2] as N mg/l | M&R | M&R | Weekly | Composite |
| Fecal Coliform[2] cfu, mpn per 100 ml | 2.2 | 23 | Weekly | Discrete |

| | | |
|---|---|---|
| MGD: Million Gallons per Day<br>M&R: Monitor & Report | cfu: Colony Forming Unit<br>mpn: Most Probable Number | ml: milliliter<br>mg/l: milligram per liter |

1. See Part I.C. of permit for additional information on sampling, testing, reporting, monitoring and definitions related to requirements.
2. During application periods, sample results are to be obtained weekly from NEV90008 and reported in Permittee's quarterly DMR.

**Rationale for Permit Requirements**

*Flow:* Flow is limited by the volume of treated effluent requested and available from the Carson City Wastewater Reclamation Plant (CCWRP). Effluent supply by CCWRP is subject to being stopped if the allowed facility total nitrogen load applied as effluent and fertilizer per year is reached before the supplier authorized volume is used.

*Total Nitrogen:* The concentration of total nitrogen in treated wastewater used for irrigation is required for purposes of determining mass discharge to irrigated landscape areas. The nitrogen concentration in treated wastewater is a component of the calculation for monthly nitrogen mass application, which is ultimately used to reconcile annual nitrogen budgets. The total nitrogen as nitrogen (as N) application rate and the annual nitrogen load (balance) are required under the EMP.

*Fecal Coliform:* The concentration of fecal coliform in treated wastewater discharged for irrigation is restricted in accordance with NAC 445A.276 Reuse Category B.

**Groundwater Monitoring Requirements**

Wells shall be monitored in accordance with permit conditions and EMP requirements. Should site conditions and/or operational activities necessitate or warrant the installation of additional monitoring wells, all wells shall be incorporated into the required monitoring schedule. All subsequent monitoring wells proposed or required (designs and locations) shall be approved by the Division prior to installation and constructed in general accordance with "WTS-4: Monitoring Well Design Requirements" (NDEP, February 1997).

If an increasing total nitrogen as nitrogen trend is evident or suspect, the EMP shall be revised to provide management practices that increase nitrogen uptake by vegetation and/or adjust other nitrogen sources such as fertilizer application rates. The Permittee shall also take all corrective action necessary to ensure that there is no further degradation of groundwater.

Discrete groundwater samples shall be collected to confirm the effective protection of groundwater under the established discharge conditions of this permit.

Monitoring wells: MW-1, MW-2, and MW-3, shall be sampled for the presence of nitrogen compounds, TDS, and chloride. Monitoring wells shall be measured and sampled according to the following parameters:

**Groundwater Monitoring**

| PARAMETERS | GROUNDWATER LIMITATIONS | SAMPLE LOCATIONS[1] | MONITORING REQUIREMENTS | |
|---|---|---|---|---|
| | Limit | Monitoring Well | Measurement Frequency[2] | Sample Type |
| Depth to Water (ft) | Monitor & Report | 1, 2, 3 | Quarterly | Discrete Measurement |
| Groundwater Elevation (ft, amsl) | Monitor & Report | 1, 2, 3 | Quarterly | Discrete Measurement |
| Total Nitrogen as N (mg/L) | 10 | 1, 2, 3 | Quarterly | Discrete |
| Nitrate as N (mg/L) | Monitor & Report | 1, 2, 3 | Quarterly | Discrete |
| Total Dissolved Solids (mg/L) | Monitor & Report | 1, 2, 3 | Quarterly | Discrete |
| Chloride (mg/L) | Monitor & Report | 1, 2, 3 | Quarterly | Discrete |

ft: feet
mg/L: milligram per liter
amsl: above mean sea level
as N: as Nitrogen

*Footnotes:*

[1]: Monitoring wells currently include: MW-1, MW-2, and MW-3. All groundwater monitoring wells installed as a function of the permitted discharge shall be included in the monitoring program prescribed.

[2]: Sampling frequency may be modified or reduced, in whole or in part, at the discretion of the Division, upon demonstration of groundwater concentrations or conditions which warrant or justify alternative monitoring schedules.

a. Groundwater monitoring wells shall be conspicuously labeled, capped to prevent migration of surface contaminants to the groundwater, and locked to restrict access.

b. Wells shall be monitored in accordance with permit conditions and Effluent Management Plan (EMP) requirements. All subsequent monitoring wells proposed or required (designs and locations) shall be approved by the Division prior to installation and constructed in general accordance with "WTS-4: Monitoring Well Design Requirements" (NDEP, February 1997).

   Abandonment of groundwater monitoring wells shall be conducted under the approval of, and in accordance with the requirements established by, the Division and the State Engineer's office.

c. If the total nitrogen as nitrogen concentration in groundwater at a monitoring well location increase to:

   i. 7.0 mg/L, the Permittee shall revise the EMP to provide management practices which increase the nitrogen uptake by vegetation and/or adjust other nitrogen sources such as fertilizer application rates.
   ii. 9.0 mg/L, the Permittee shall take all corrective action necessary to ensure no further degradation of groundwater.
   iii. 10.0 mg/L, the Permittee shall discontinue the use of reclaimed wastewater and the discharge to groundwater shall cease, unless otherwise authorized by the Division.

**Schedule of Compliance and Special Conditions**

The Permittee shall implement and comply with the provisions of the following schedule of compliance after approval by the Administrator, including in said implementation and compliance, any additions or modifications which the Administrator may make in approving the Schedule of Compliance.

a. The Permittee shall achieve compliance with the effluent limitations upon issuance of the permit.

b. The Permittee shall maintain and revise, as necessary, the Effluent Management Plan (EMP) sections for each site keeping all information required by I.B of the permit current in accordance with WTS-1-B design criteria. Materials submitted for Division approval shall be stamped by a registered Nevada PE.

Within ninety (90) days of permit effective date, **MM DD, 2011,** the Permittee shall:

i. Submit an updated EMP for the permittee's managed reclaimed water use site(s) for review and approval by the Division. The submitted EMP shall include any change made to the treatment system since the last Division approved edition needed to comply with this permit as issued.
***OR***
ii. Submit a letter to the Division indicating that the current approved EMP has not changed since the last Division approval and that the manual and approved operations are still valid for the permittee's managed reclaimed water use site(s).

c. In adherence with the approved EMP, the Permittee shall provide the following certification with each quarterly report: *"I certify that during each month of the previous quarterly reporting period, all operational procedures outlined in the approved Effluent Management Plan for this facility were adhered to."*

**Proposed Determination**
The Division has made the tentative determination to issue the proposed permit for a period of five (5) years.

**Procedures for Public Comment**:
The Notice of the Division's intent to issue the permit authorizing the facility to discharge to the groundwater of the State of Nevada subject to the conditions contained within the permit is being sent to the **Reno Gazette Journal** and the **Nevada Appeal** for publication. The notice is being mailed to interested persons on the NDEP-BWPC mailing list. Anyone wishing to comment on the proposed permit can do so in writing for a period of 30 days following the date of the publication of the public notice. All comments must be received by 5:00 pm local time on August 9, 2011. The comment period can be extended at the discretion of the Administrator.

A public hearing on the proposed determination can be requested by the applicant, any affected State, any affected interstate agency, the Regional Administrator or any interested agency, person or group of persons.

The request must be filed within the comment period and must indicate the interest of the person filing the request and the reasons why a hearing is warranted.

Any public hearing determined by the Administrator to be held must be conducted in the geographical area of the proposed discharge or any other area the Administrator determined to be appropriate. All public hearings must be conducted to accordance with NAC 445A.238.

The final determination of the Administrator may be appealed to the State Environmental Commission pursuant to NRS 445A.605.

Prepared by: E. Samuel Stegeman, P.E.
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